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Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) An activated carbon-metal oxide matrix, comprising:
an activated carbon; and
between about 3% and about 15% by weight of a metal oxide; wherein the metal oxide is an oxide of a metal selected from the group consisting of Ca, Mg, Ba, and combinations thereof, and wherein the metal oxide is uniformly dispersed within the activated carbon-metal oxide matrix and the activated carbon-metal oxide matrix has a breakthrough capacity of at least about 0.26 gH₂S/ccC.
2. Cancelled
3. (Currently amended) The activated carbon-metal oxide matrix of claim 1, wherein the metal oxide is magnesium oxide.
4. (Previously amended) The activated carbon-metal oxide matrix of claim 1, comprising between about 5% and about 10% by weight of a metal oxide.
38. (Currently amended) A method for removing an odorous compound from a gaseous stream comprising:
forming an activated carbon-metal oxide matrix, the matrix comprising between about 3% to about 15%, by weight, of a metal oxide uniformly dispersed within the matrix, and having a hydrogen sulfide breakthrough capacity greater than about 0.26 gH₂S/ccC, wherein the metal oxide is an oxide of a metal selected from the group consisting of Ca, Mg, Ba, and combinations thereof;
contacting the gaseous stream with the matrix;

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sorbing the odorous compound; and
removing the gaseous stream from the matrix.

39. (Original) The method of claim 38, wherein the matrix has a hydrogen sulfide breakthrough capacity greater than about 0.46 gH₂S/ccC.

40. (Original) The method of claim 39, wherein the matrix has a hydrogen sulfide breakthrough capacity greater than about 0.54 gH₂S/ccC.

41. (Original) The method of claim 39, wherein the matrix has a hydrogen sulfide breakthrough capacity greater than about 0.65 gH₂S/ccC.

42. Cancelled.

43. (Currently amended) The method of claim 38 42, wherein the metal oxide is magnesium oxide.

44. (Previously amended) The method of claim 38, wherein the gaseous stream includes moisture.

45. (Original) The method of claim 44, wherein the gaseous stream has a moisture content of about 60% to about 95% RH.

55. (Currently amended) A method for reducing the concentration of a sulfide present in a gaseous discharge from a waste water treatment system comprising:

providing a gaseous discharge including at least one volatile organic compound and hydrogen sulfide, wherein the gaseous discharge has a moisture content;

contacting the gaseous discharge with an activated carbon-metal oxide matrix comprising about 3% to about 15%, by weight, of a metal oxide uniformly dispersed within the matrix, and having a hydrogen sulfide breakthrough capacity greater than about 0.26 gH₂S/ccC;

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sorbing the sulfide on the matrix producing a product stream having a sulfide concentration less than about 0.1 ppm; and

removing the product stream from the activated carbon-metal oxide matrix,
wherein the metal oxide is an oxide of a metal selected from the group consisting of Ca, Mg, Ba, and combinations thereof.

56. (Original) The method of claim 55, wherein the gaseous discharge is contacted with an activated carbon-metal oxide matrix comprising about 5% to about 10%, by weight, of a metal oxide.

57. (Original) The method of claim 55, further comprising sorbing the at least one volatile organic compound on the matrix.

58. Cancelled

59. (Currently amended) The method of claim ~~55~~ 58, wherein the metal oxide is magnesium oxide.

60. (Previously amended) The method of claim 55, wherein the gaseous discharge has a moisture content that does not condense on the matrix.

61. (Original) The method of claim 60, wherein the moisture content is between about 60% to about 95%RH.

62. (Cancelled)

63. (Cancelled)

64. (Cancelled)

65. (Cancelled)

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66. (Previously presented) The method of claim 59, wherein sorbing the sulfide on the matrix comprises oxidizing the hydrogen sulfide to sulfur and sorbing the sulfur on the matrix.

67. (Previously presented) The method of claim 43, wherein the odorous compound is hydrogen sulfide.

68. (Previously presented) The method of claim 67, wherein sorbing the odorous compound comprises oxidizing hydrogen sulfide to sulfur and sorbing sulfur on the matrix.

69. (Previously presented) The activated carbon-metal oxide matrix of claim 1, wherein the activated carbon-metal oxide matrix has a breakthrough capacity of at least about 0.3 gH₂S/ccC.

70. (Currently amended) The method of any one of claims 38 and 55, wherein the activated carbon-metal oxide matrix has a breakthrough capacity of at least about 0.3 gH₂S/ccC.

71. (Currently amended) An ~~activate~~ activated carbon-metal oxide matrix, comprising:
an activated carbon; and
a metal oxide;
wherein the metal oxide is uniformly dispersed within the activated carbon-metal oxide matrix, and

wherein the activated carbon-metal oxide matrix has a pore volume substantially free of the metal oxide, and wherein the metal oxide is an oxide of a metal selected from the group consisting of Ca, Mg, Ba, and combinations thereof.

72. (Currently amended) An activated carbon-metal oxide matrix formed by
preoxidizing a carbonaceous material to form ~~peroxidized~~ preoxidized carbonaceous material;
grinding the ~~peroxidized~~ preoxidized carbonaceous material;
combining the ground ~~peroxidized~~ preoxidized carbonaceous material with a metal oxide and a coal tar pitch to form a mixture;

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extruding the mixture to form an extrudate;
carbonizing the extrudate to form a char; and
activating the char to form an activated carbon-metal oxide matrix, wherein the metal
oxide is uniformly dispersed therein,
wherein the metal oxide is an oxide of a metal selected from the group consisting of Ca,
Mg, Ba, and combinations thereof.

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